



Harvey®

Hydroclave MC8
Hydroclave MC10

Steam Sterilizer
(With Optional Non-Recirculating System)

OWNER AND OPERATOR MANUAL

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Introduction

As leaders in the field of sterilization, our goal is to engineer and manufacture safe, efficient, quality sterilization products. We are certain you will agree that this sterilizer meets our goal.

Regardless of how well a piece of equipment is designed, misuse, abuse, or neglect will deny its owner the safe, efficient, quality service expected. Often, misuse, abuse or neglect occurs unintentionally because the operator is unaware of the proper operating and maintenance procedures. This manual provides you with the information required to properly operate and routinely maintain your sterilizer. The information included in this manual applies to all models unless noted for specific models.

We urge you to read this manual carefully before operating the unit, and retain it for future reference.

Operation Overview

Hydroclave MC8 and MC10 Steam Sterilizer

The MC8 and MC10 sterilizer operates on the principle of heated water converted to steam in a sealed pressure chamber.

What happens when the controls are turned on?

- The chamber vent valve opens and the heater turns on to warm up the chamber. The items to be sterilized are placed on the trays and the trays are placed inside the sterilizer chamber. (Certain parameters such as positioning and size of the load must be observed for proper operation and satisfactory result.) Then, the door is closed and latched, and the "START" button pressed to start the cycle.

What happens when the cycle starts?

- The water fill valve opens and the proper amount of water automatically flows from the reservoir into the chamber.
- The water in the chamber begins to heat. As the water turns to steam, the temperature and pressure increase, forcing air from the chamber.
- When the temperature in the chamber reaches the proper temperature (121 or 135°C) the exposure timer begins. During this exposure time, the temperature in the chamber is automatically maintained at either 121 or 135°C, plus or minus about two degrees.
- At the completion of the exposure time a solenoid valve opens, allowing the steam and water to vent back into the reservoir. The steam reenters the reservoir through tubing below the water level in the reservoir. The water in the reservoir condenses the steam to a liquid for reuse in the next cycle.

When the vent is complete an indicator light on the control panel lights to alert the operator that the cycle is complete.

Drying cycle

At the completion of the sterilization cycle, the drying cycle automatically begins. This cycle continues until the selected time has elapsed or the door is opened.

To restart a drying cycle that has been terminated by opening the door; close the door (DO NOT LATCH) and press the "START" button.

Operator Maintenance

It is important to establish the maintenance schedule called for in the **Operator Maintenance** section of this manual.

Daily

Before each days use: Check the water level in the reservoir. Refill with distilled or deionized water if needed. Clean the door gasket and its mating surface.

Weekly

Clean the chamber, rack and trays once a week to prevent a buildup of mineral deposits inside the chamber. Normal tap water contains chemicals and minerals, chlorine being the most common. Chlorine is especially corrosive to the stainless steel chamber, trays and rack when water is turned to steam during the sterilization process. It is important to remove any mineral deposits regularly to ensure peak operating efficiency.

Distilled or deionized water should always be used in the MC8 and MC10 steam sterilizer. Even when distilled or deionized water is used, some contaminants can collect in the chamber, rack and trays.

Clean the reservoir, reservoir filter and chamber screen at least every 25 cycles. A clogged filter and/or screen will result in restricted water flow and prolong the time it takes to fill the chamber.

Maintaining a clean reservoir, filter and chamber screen is especially important. Foreign particles, such as bits of oil, adhesives, amalgam, etc., can be picked up from items being sterilized and returned to the reservoir, clogging the filter and screen.

The daily and weekly maintenance should be performed as outlined above to ensure long, trouble-free service. Failure to routinely perform maintenance procedures could result in processing delays or equipment down time and possible equipment repairs.

Detailed maintenance procedures for those listed above and also other "as required" items are shown in the Operator Maintenance section of this manual.

Safety Information

Alert Signals



Warning

Warnings alert you to a possibility of personal injury.



Caution

Cautions alert you to a possibility of damage to the equipment.



Note

Notes alert you to pertinent facts and conditions.



Hot Surface

Hot surfaces alert you to a possibility of personal injury if you come in contact with a surface during use or for a period of time after use.

NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radiofrequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The special safety information instructions that follow appear within the manual. Read them carefully before operating the unit and follow instructions.

Declaration of Conformity

Barnstead International hereby declares under its sole responsibility that this product conforms with the technical requirements of the following standards (applies to units with CE mark on unit spec label only):

EMC: EN 61000-3-2	Limits for Harmonic Current Emissions
EN 61000-3-3	Limits for Voltage Fluctuations and Flicker
EN 61326-1	Electrical Equipment for Measurement, Control and Laboratory use; Part I: General Requirements
Safety: EN 60601 IEC 601-1	Medical Electrical Equipment; Part 1: General Requirements for Safety

per the provisions of the Electromagnetic Compatibility Directive 89/336/EEC, as amended by 92/31/EEC, and per the provisions of the Low Voltage Directive 73/23/EEC, as amended by 93/68/EEC.

The authorized representative located within the European Community is:

Electrothermal Engineering, Ltd.
419 Sutton Road
Southend On Sea
Essex SS2 5PH
United Kingdom

Copies of the Declaration of Conformity are available upon request.

Description of Symbols on the Equipment



Hot Surface



Printer Receptacle



Attention: Consult Accompanying Documents
(Refer to Warning and Caution notes in this manual.)



Type B Equipment, Class I
(Refer to IEC Standard 601-1.)



OFF (Only for a part of equipment.)*

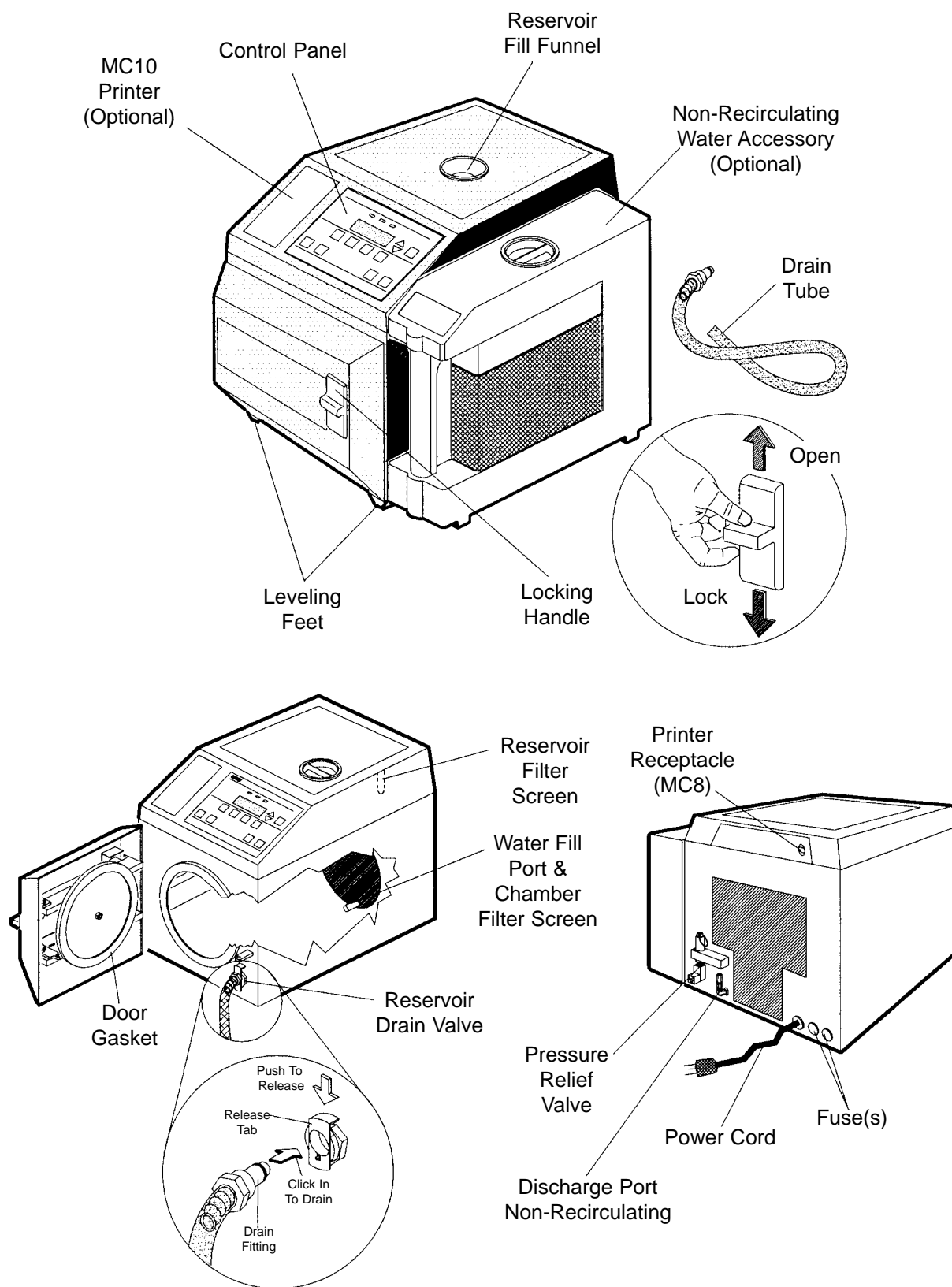


ON (Only for a part of equipment.)*



Paper Feed

** Does not disconnect equipment from mains voltage (AC power)*



Hydroclave MC8/MC10 Sterilizer Overview

General Description



Warning

Volatile Reaction: Do not use this sterilizer for processing volatile substances or for any purpose other than its intended design. Failure to heed this warning could cause personal injury to personnel or damage to equipment.

Intended Use

The Hydroclave MC8 and MC10 Sterilizers have been designed for use in medical and dental offices, hospitals, clinics, laboratories and other facilities where a variety of materials require processing.

This steam sterilizer can be used for wrapped or unwrapped instruments, linen packs, and liquids. Glassware may be processed using the liquids cycle.

General Usage

Do not use this product for anything other than its intended use.

Operating Features

- Four preset sterilizing cycles—unwrapped instruments, wrapped instruments, packs and liquids. Exposure and drying times are adjustable.
- Automatic closed door drying and optional open door drying (except for liquid cycle). Drying times are adjustable.
- Cycle runs automatically when START switch is pressed.
- Optional printer records temperature and pressure during cycle.
- Chamber temperature may be displayed in °C or °F.
- Chamber temperature is displayed continuously throughout cycle (excluding dry phase) and may be displayed in psi, kPa or bars.
- Messages may be displayed in English, French, Spanish or German.
- Clock format may be 12-hour or 24-hour.
- Non-recirculating discharge of steam is available as an option. This option may be installed in the field by a service technician or purchased and installed by the owner/operator.

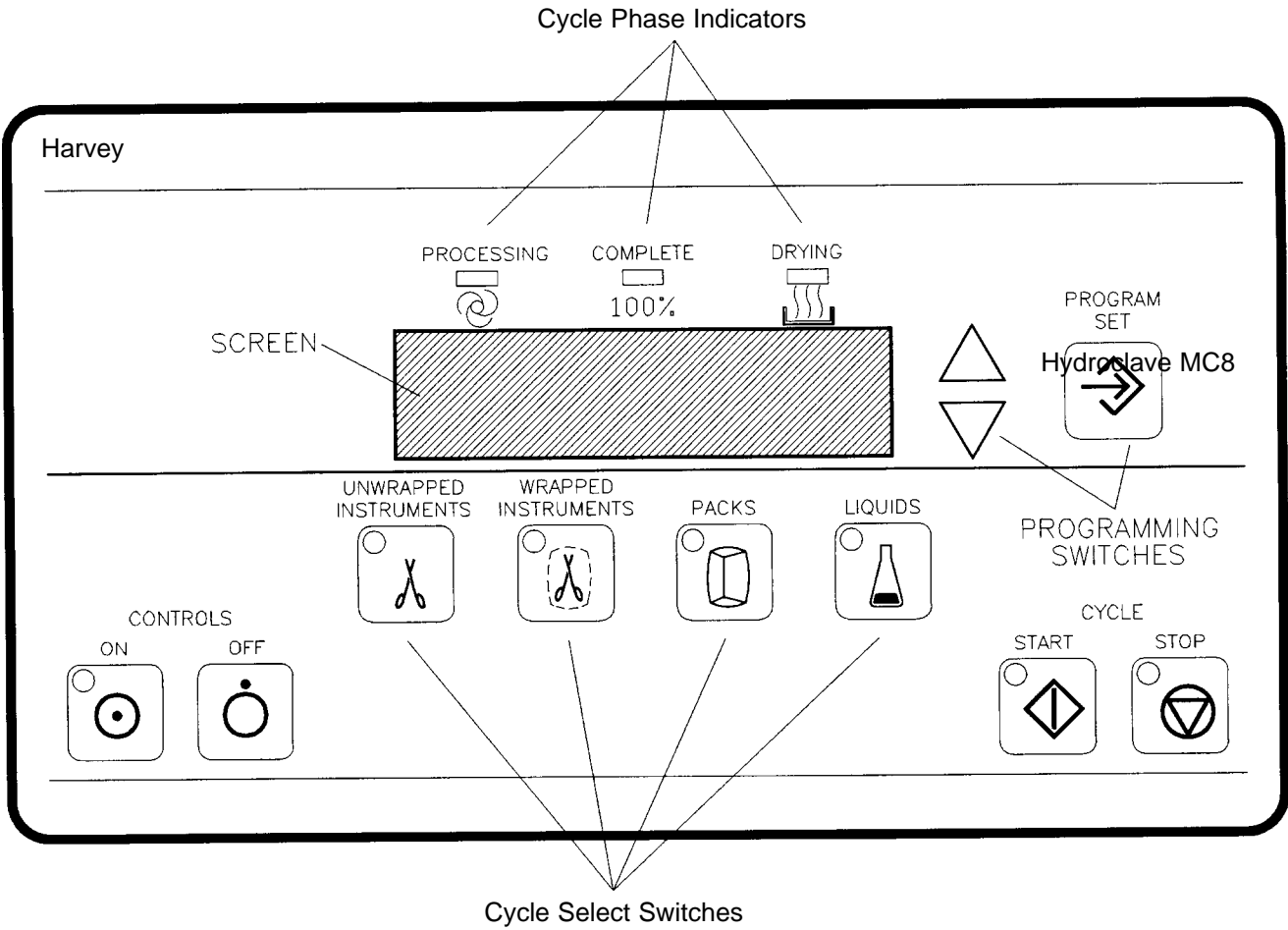
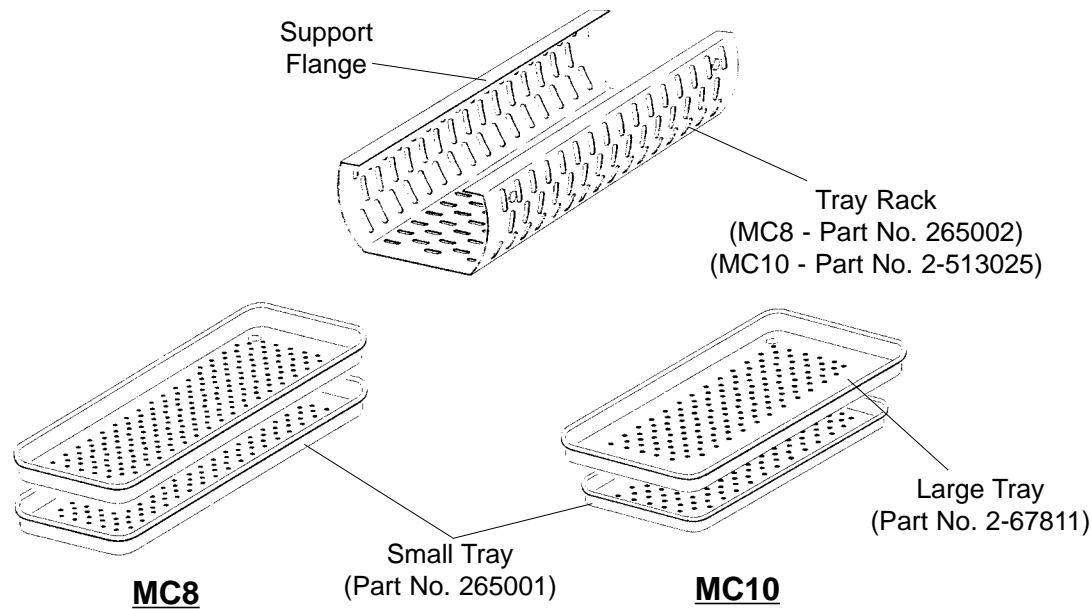
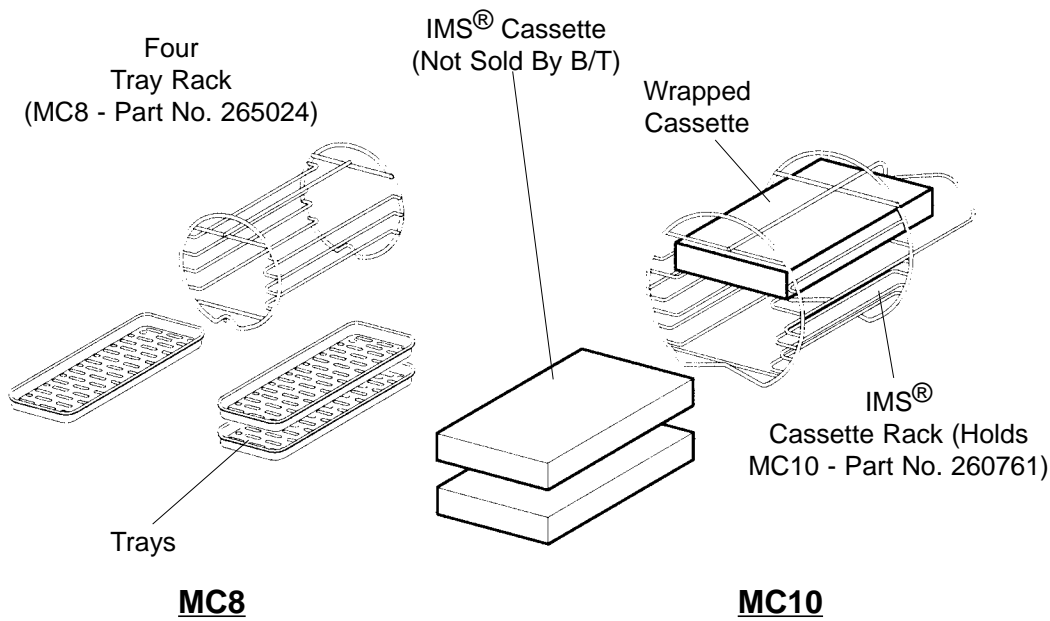


Figure 1
Control Panel

GENERAL DESCRIPTION



*Figure 2
Standard Accessories*



*Figure 3
Optional Accessories*

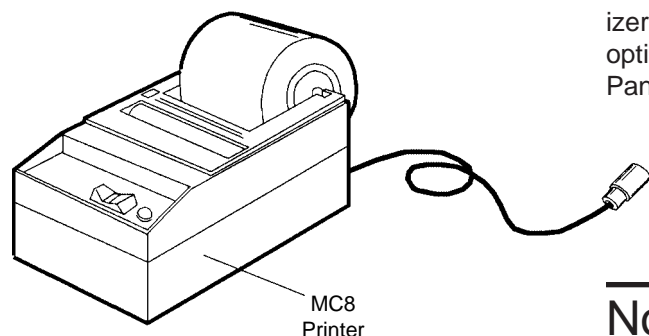


Figure 4
MC8 Printer

Printer

The MC8 printer is a separate unit connected to the sterilizer by a plug-in cable and a separate power supply. The optional MC10 printer is an integral part of the Control Panel.

Non-Recirculating Water Accessory

Standard MC8 and MC10 sterilizers discharge steam back into the reservoir. For sterilizers with the non-recirculating system, the distilled water is used to make steam in the chamber for one cycle only. Used water (steam) is exhausted into the cooling tank which then overflows into the collection bottle. The collection bottle is then emptied when full.

An optional overflow tube is provided for connection to the back of the cooling tank. This feature allows the excess water to drain directly into a sink or drain (if available), eliminating the need to periodically empty the collection bottle.

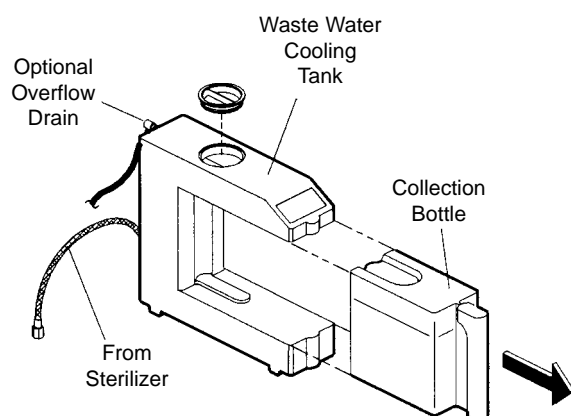


Figure 5
Non-Recirculating Water Accessory

Recommended Steam Sterilization Monitoring Program

All functions of the sterilizer should be monitored to provide maximum sterilization assurance.

The Joint Commission on Accreditation of Hospitals and the American Dental Association recommends that biological indicators be used at least weekly to check the effectiveness of steam sterilizers to sterilize; i.e., to kill test organisms of a known high resistance. (*Bacillus stearothermophilus* is the recommended test organism for monitoring steam sterilization.)

GENERAL DESCRIPTION

We recommend the use of process indicators such as the BJT Check Indicator within each package of each cycle. For additional assurance that minimum sterilizing conditions have been achieved, a biological indicator such as BJT Sure should be used at least once a week.

Description	Part No.
Chemitest Self-Sealing Bags	
Tray Size: 5" x " x 55" (150 per box)	230300001
Instrument Size: 2.5" x 1.5" x 10.5" (250 per box)	230301001
Chemitest See-Thru Indicator Pouches	
Tray Size: 5" x 15.5" (150 per box)	230302001
Biological Indicators	
BJT Sure Biological Indicator (Box of 5 Indicator vials) Spore Population 10 ⁵	AY759X1
BJT Sure Biological Indicator (Box of 100 Indicator vials) Spore Population 10 ⁵	AY759X3
BJT Sure Biological Indicator (Box of 100 Indicator vials) Spore Population 10 ⁶	AY759X8
Process Indicators	
Chemical Indicator Strips (Box of 250) <i>Steam Sterilizers Only.</i>	AY759X2
Chemitest Indicator Tape—Closure system for packs, bags or other containers	260577
Roll is 1.5" (3.8 cm) x 360" L (91.4 mm)	
Chemitest Indicator Strips, (Box of 250) <i>Chemiclave Sterilizers Only.</i>	230305001
Chemitest Indicator Tabs, Roll of 250, Self-adhering tabs, 1.5" (3.8 cm) sq.	230306001
Instrument Packaging for Clean Process and Temperature Verification	
Chemi-Test See-thru, Self-Sealing Pouches (Box of 200) 2.25" x 5"	ZSX152
Chemi-Test See-thru, Self-Sealing Pouches (Box of 200) 2.75" x 10"	ZSX153
Chemi-Test All Paper, Self-Sealing Pouches (Box of 250) 2.5" x 10.5"	230301001
Chemi-Test See-thru, Self-Sealing Pouches (Box of 200) 3.5" x 10"	ZSX155
Chemi-Test See-thru, Self-Sealing Pouches (Box of 200) 5.25" x 11"	ZSX156
Chemi-Test All Paper, Self-Sealing Pouches (Box of 150) 5" x 15"	230300001
Chemi-Test See-thru, Non-self-Sealing Pouches (Box of 150) 5" x 15"	230302001

Operation

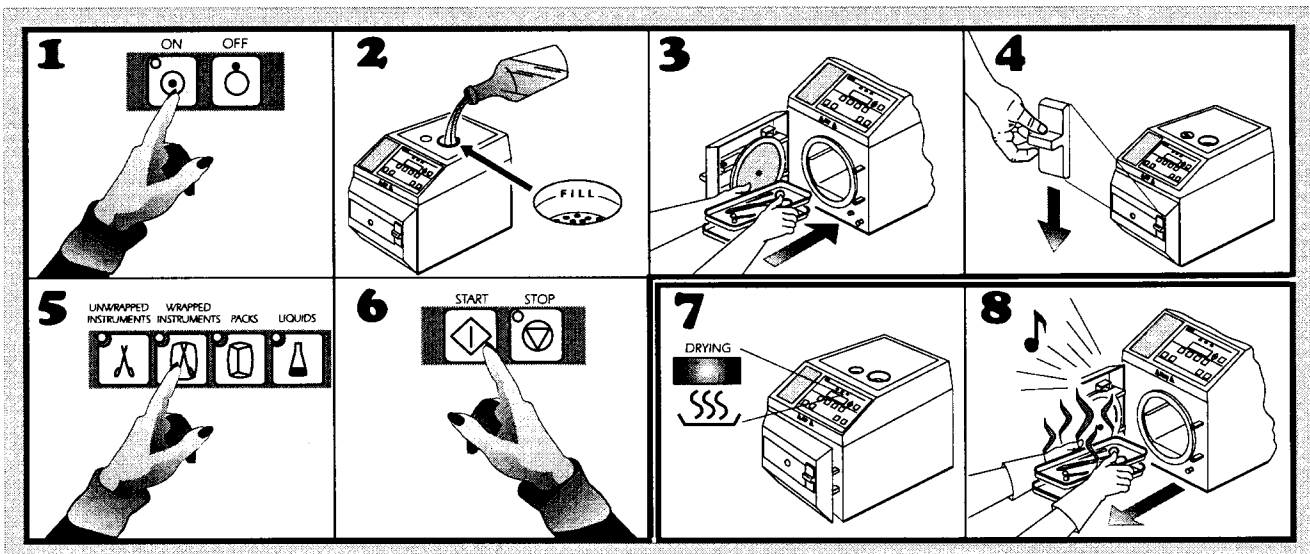


Warning

Patient Safety Zone: Do not operate this sterilizer within 6 ft. (2 m) of patient treatment point.

1. Press Controls ON.
2. Fill Reservoir.
3. Load Chamber.
4. Lock Door.
5. Select Cycle.
6. Press START.
7. Open Door to Dry.*
8. Remove Load.

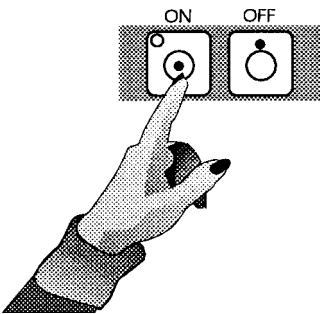
** Optional—Drying phase, if selected, will start automatically without opening the door. Opening the door, however, may improve drying efficiency.*



Operation

**Note**

If time and date are incorrect, reset the clock/calendar.



Power On/Controls On

Power On/Controls On

1. When the sterilizer is plugged in and the controls are off, the time and date will be displayed.
2. Press Controls ON switch to turn on the control panel. The cycle temperature, exposure time and drying time will be displayed and the Standby Mode will begin. During the Standby Mode, the heater turns on to warm the chamber to approximately 38°C. The heater then cycles ON and OFF to maintain the warm temperature.
3. Turn ON the optional printer (see **Printer** section).



Caution
Use only distilled or low quality deionized water (minimum 0.5 megohm/cm, maximum 1.5 megohm/cm). Normal tap water contains minerals that will corrode sterilizer parts.



Note
 Be sure reservoir drain valve is closed before filling the reservoir.



Warning
Burn Hazard: Do not add water to the reservoir while sterilization cycle is in progress. Steam vented into reservoir at end of cycle could result in possible burns.

The water in the reservoir could be HOT if multiple cycles have been run in succession.

Reservoir lid must be in place when sterilizer is in use.

Filling Reservoir

Add distilled or low quality deionized water (minimum 0.5 megohm/cm, maximum 1.5 megohm/cm) to the reservoir up to the fill line. The MC8 reservoir holds approximately 3 liters; the MC10 reservoir, 4 liters. Do not overfill.

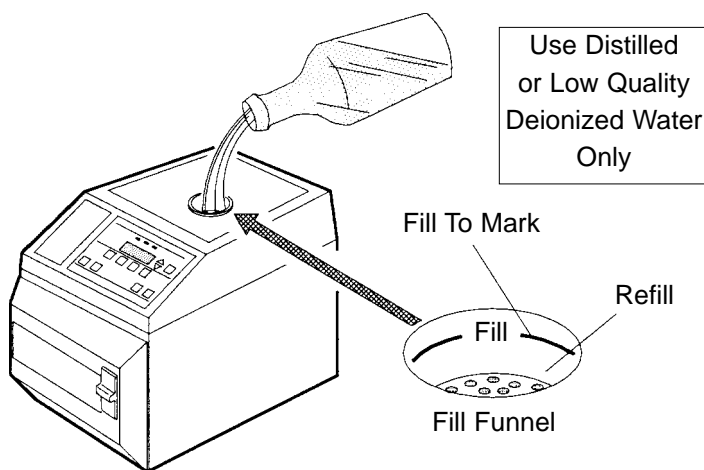


Figure 7
 Filling Reservoir

OPERATION



Note

The cooling tank must be connected to the sterilizer before filling the tank with water.



Note

Do not operate sterilizer unless the cooling tank is filled with distilled or deionized water and attached to the sterilizer.



Hot Surface

Burn Hazard: Do not empty the collection bottle when the sterilizer is in operation.



Note

It is important to periodically check the water level in the collection bottle. Failure to empty the bottle when full will result in water overflowing onto surrounding surfaces.

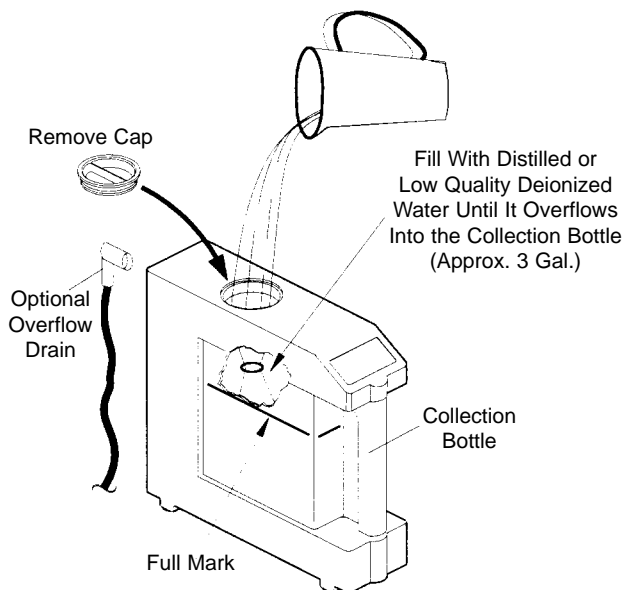


Figure 8
Non-Recirculating Water Accessory

Filling Non-Recirculating Tank (Option)

1. Remove the cap from the cooling tank.
2. Fill the cooling tank with distilled or deionized water until the water begins to flow from the cooling tank into the collection bottle (or into the drain if the overflow tube is installed).
3. Replace the cap.

Emptying Collection Bottle

1. Empty the collection bottle when the water in the bottle reaches the FULL mark.
2. Slide the bottle away from the cooling tank to remove.
3. Pour the contents down the drain.

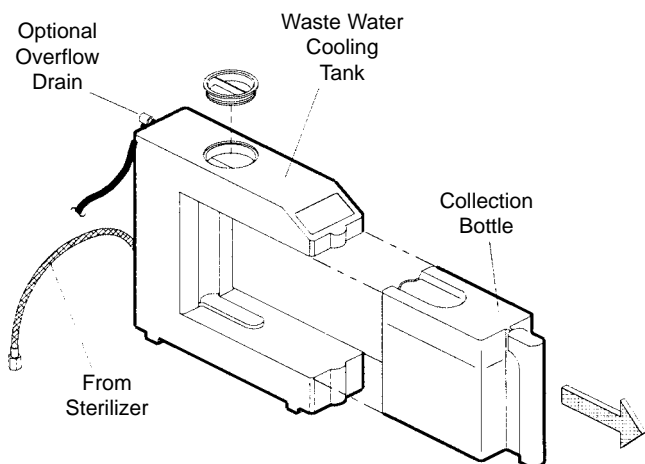


Figure 9
Emptying Collection Bottle

**Note**

The sink or drain must be below the level of the cooling tank for the water drain.

**Warning**

Volatile Reaction: Do not use this equipment for processing volatile substances or for any purpose other than its intended design. Failure to observe this warning could cause personal injury or damage to equipment.

**Warning**

Burn Hazard: To prevent the possibility of injury from liquids boiling over and/or containers exploding, use only self-venting automatic sealing stoppers recommended by manufacturers when processing all container liquids or media.

**Caution**

Be sure items can withstand cycle temperature before placing them in sterilizer. If in doubt, refer to device manufacturer's instructions.

**Note**

Be sure to select the correct cycle for the type of load. Sterilization cannot be assured if maximum load size and density are exceeded. Total specified weight should not be exceeded for any sterilizer cycle.

**Note**

Use the LIQUIDS cycle to process glassware.

Installing Overflow Tube (Optional)

If the sterilizer is located within 5 ft. (1.5 m) of a sink or drain, the overflow tube may be used. The collection bottle will not require emptying while the automatic overflow is used.

1. Push the overflow tube (supplied) into the upper quick connect on the back of the cooling tank.
2. Push the tube connector in until it "clicks."
3. Place the end of the overflow tube in a sink or drain(atmospheric drain).

Load Chart

Cycle	MC8	MC10
Unwrapped Instruments	10 lbs. (4.5 kg)	12 lbs. (5.4 kg)
Wrapped Instruments	6 lbs. (2.7 kg) double-wrapped instruments.	10 lbs. (4.5kg) double-wrapped instruments.
	Three small metal IMS* cassettes, 5" x 7", single-wrapped, 12 oz. (340 g) each.	Three IMS* cassettes, single-wrapped, 1.5 lbs. (680 g) each.
	Eight 6" x 10" pouches or twenty 3" x 5" pouches, two hinged instruments per pouch.	Fourteen 6" x 10" pouches or twenty-eight 3" x 5" pouches, two hinged instruments per pouch.
Packs	One ADA spec. #59 pack.	Two ADA spec. #59 packs.
Liquids	Three 250 ml beakers, 75% full.	Three one liter flasks, 75% full.

* IMS is a trademark of Hu-Friedy Mfg. Co., Inc.

Preparing Items for Sterilization

- Clean and dry items thoroughly before placing in the sterilizer. Ultrasonic cleaning is recommended to remove stubborn debris.
- After cleaning, rinse instruments thoroughly with deionized or distilled water. Inspect instruments to ensure that all debris has been removed.
- Small bits of wax, oil, amalgam, etc., on instruments can be dislodged during sterilization and circulated through the sterilizer piping. This could eventually cause partial restriction of water flow and the need for possible service.
- Unwrapped goods can be placed directly on tray liner in the bottom of the tray. Do not use paper towels.
- Open all hinged instruments.
- Uncover empty containers and place them on their sides.
- Device manufacturers (i.e., manufacturers of handpieces and specialty items) instructions must be followed for proper cleaning and sterilization of those devices.

Loading

1. Place items to be processed in appropriate trays or holders and place in the sterilization chamber.
2. Close the sterilizer door and push the door latch down firmly.



Note

Whether using the two tray, four-tray, or IMS cassette rack, items being processed should be evenly distributed on each tray or cassette and within the sterilization chamber.

Do not allow bags, pouches or wraps to touch the chamber walls. Moisture from the walls could cause wet packs or pouches.

Do not overload. Steam may not penetrate tightly packed loads.

Do not layer pouches or load them plastic side down as they will retain water.

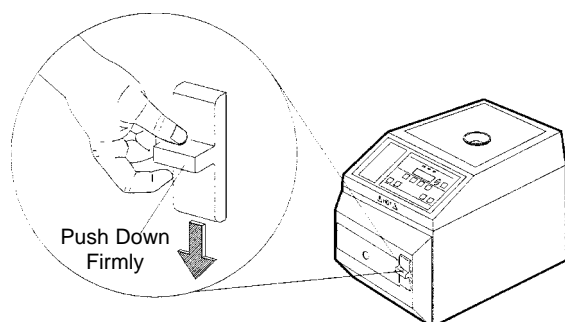


Figure 10
Locking the Door

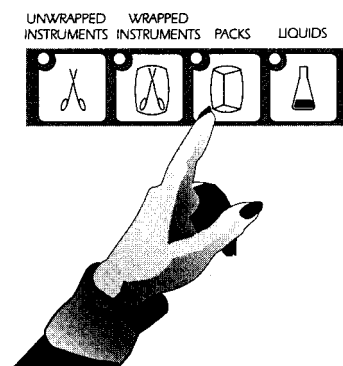


Figure 11
Selecting Cycle

Selecting Cycle

When the controls are turned on, the settings for the previous cycle will be displayed.

To select a different cycle, press the desired cycle selector switch.

To change the exposure time and/or drying time:

- Press the PROGRAM/SET switch. The exposure time will flash.

TEMP	TIME	DRY
135C	03	15

- Press the up or down arrows to increase or decrease the exposure time. Times less than the minimum values, listed below, are not available.
- Press the PROGRAM/SET switch to save the drying time value. The sterilizer is now ready to run a cycle.

TEMP	TIME	DRY
135C	03	15

Unwrapped Instruments	3 minutes minimum
Wrapped Instruments	5 minutes minimum
Packs	30 minutes minimum
Liquids	30 minutes minimum

OPERATION



Note

The open door drying time is limited to the selected closed door drying time. If zero is selected, open door drying is not possible.



Note

The saved values become the new cycle parameters.

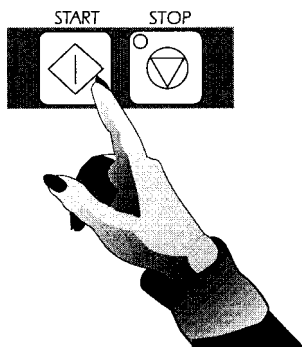


Figure 12
Starting Cycle



Note

Thirty minutes may be needed for wrapped loads of 6 to 10 lbs. in a single tray. Double tray loads may require slightly more time and unwrapped items less drying time. Several trial cycles may be necessary to determine a suitable drying time for your type of load situation.



Warning

Burn Hazard: To prevent burns from escaping steam, always stand back (behind door) when opening the door.

- d. Press the UP or DOWN arrows to increase or decrease the drying time.
- e. Press the PROGRAM/SET switch to save the drying time value. The sterilizer is now ready to run a cycle.

Starting Cycle

Press START switch. The PROCESSING indicator will light and the chamber will start to heat up.



When the selected exposure temperature is reached, the exposure time display will start to count down.

To cancel a cycle in progress, press the STOP switch.

Drying Phase

The drying phase, if selected, will start automatically at the end of the cycle. (Three groups of three beeps will sound.) The DRYING indicator will light and the drying time will start to count down.



For more efficient drying, opening the door is strongly recommended. (See Open Door Drying procedure).

At the end of closed door drying, three groups of three beeps will sound and the COMPLETE indicator lights.

To cancel drying phase in progress, press the STOP switch.

OPERATION



Note

Closed door drying will stop when the door is opened. When START is pressed to begin open door drying, the timer will be reset to the programmed drying time.

The open door drying time is limited to the selected closed door drying time. If zero was selected, open door drying is not possible.

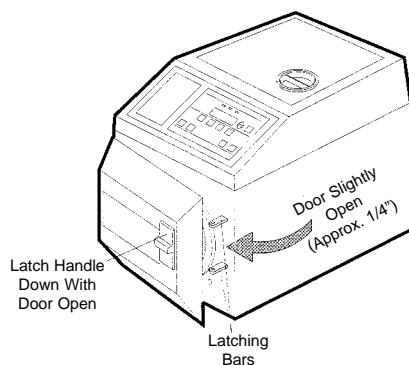


Figure 13
Drying Cycle Operation



Hot Surface

Burn Hazard: Processed load and inner surfaces of the sterilizer will be HOT at completion of cycle. Wear proper protective clothing when removing load.



Warning

Burn Hazard: Always stand back (behind door) when opening sterilizer door. Open door slowly and only partially to protect against steam escaping from chamber, boiling liquids or exploding flasks.



Note

Unwrapped instruments processed in the sterilizer should not be considered sterile when exposed to unsterile environments.

Open Door Drying

1. Unlock and open the door. Two beeps will sound and the indicator lights will turn off.
2. Push down on the door latch so that the door will remain ajar.
3. Press START to begin drying phase. The DRYING indicator will light.
4. At the end of the drying phase, three groups of three beeps sound, and the COMPLETE indicator will turn off after 60 seconds.
5. The open door drying phase may be repeated by leaving the door open and pressing START twice.

Removing Load

When the cycle (including drying phase) is complete, three groups of three beeps will sound and the COMPLETE indicator will light. If open door drying was used, however, the COMPLETE indicator will turn off after one minute.

PROCESSING



COMPLETE



DRYING

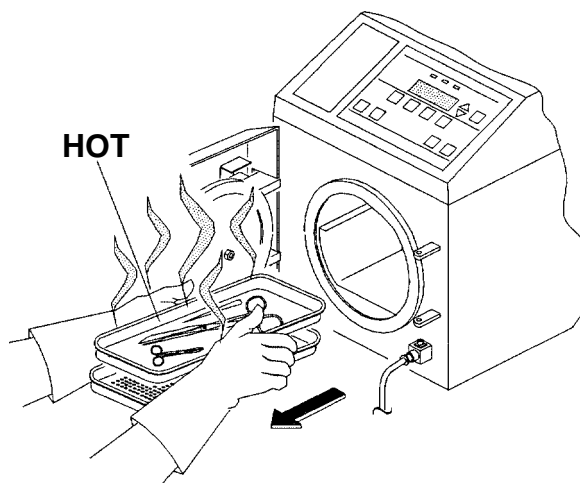
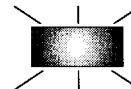


Figure 14
Removing Load

Additional Information



Note

If a cycle is canceled prematurely, reprocess the load. Failure to do so may result in non-sterile goods.



Warning

Volatile Reaction: Do not open the door if there is a liquid load in the chamber. The containers may boil over or explode. Call for authorized service.



Caution

The door will not open if there is pressure or vacuum in the chamber. Do not attempt to force the door open. Press OFF, then ON, to vent the chamber so that the door can be opened.

Cancel Cycle

To cancel a sterilizing cycle or drying phase in progress, press the STOP switch.

Emergency Power Off

To remove all power from the sterilizer, press the OFF switch, then unplug the power cord.

Power Failure During Cycle

If a power failure occurs during a cycle, the current program will be stored in memory.

When power is restored, the controls will attempt to continue the cycle or will cancel the cycle depending on the length of the power interruption.

If you cannot start a cycle after power is restored:

1. Unplug the unit.
2. Press and hold the OFF button while plugging the unit back in.
3. Release the OFF button after "PERFORMING SELF-TEST" is displayed.

Diagnostic Messages

Message	What To Do
SELF TEST FAILED CALL SERVICE	Call for authorized service.
CONTROLS ERROR CALL SERVICE	<p>Press OFF, then ON. If "CONTROLS ERROR" message is not cleared, go to step #2.</p> <p>Unplug the unit, then press and hold OFF button while plugging back in. Release OFF button after "PERFORMING SELF-TEST" is displayed.</p> <p>If step #2 does not clear the "CONTROLS ERROR" message, call for authorized service.</p>
HEAT UP TOO LONG CYCLE CANCELED REPROCESS LOAD	<p>Reprocess load and run cycle again.</p> <p>Call service if message occurs two cycles in a row.</p>
OVERHEAT CYCLE CANCELED REPROCESS LOAD	<p>Check water level in reservoir.</p> <p>Remove and clean reservoir and chamber screens. Make sure unit is on a level surface.</p> <p>Reprocess load and run cycle again.</p> <p>Call service if message occurs two cycles in a row.</p>
VENT TOO LONG CHECK FOR DEBRIS IN CHAMBER	<p>Wait for chamber to cool, then open door. Check for debris in chamber or clean chamber filter.</p> <p>Reprocess load and run cycle again. Call service if message occurs two cycles in a row.</p>
DOOR OPEN CYCLE CANCELED REPROCESS LOAD	<p>Be sure door is closed and latched. (Press down.)</p> <p>Reprocess load and run cycle again.</p>
PRESSURE TOO LOW CYCLE CANCELED REPROCESS LOAD	<p>Clean gasket and check for rips and holes.</p> <p>Reprocess load and run cycle again.</p> <p>Call service if message occurs two cycles in a row.</p>
TEMPERATURE TOO LOW CYCLE CANCELED REPROCESS LOAD	<p>Reprocess load and run cycle again.</p> <p>Call service if message occurs two cycles in a row.</p>
UNIT ERROR PRESS OFF TO CONTINUE	<p>Press OFF, then press ON again.</p>
PRESSURE TOO HIGH CYCLE CANCELED REPROCESS LOAD	<p>Reprocess load and run cycle again.</p> <p>Call service if message occurs two cycles in a row.</p>
TEMPERATURE TOO HIGH CYCLE CANCELED REPROCESS LOAD	<p>Wait for chamber to cool.</p> <p>Reprocess load and run cycle again.</p>

Troubleshooting

Problem	Possible Cause	What To Do
Wrapped loads are wet at completion of sterilize cycle.	Load improperly loaded in chamber.	Be sure wrap is not touching the walls of the chamber. Do not place wrapped goods on bottom of tray rack (10" chamber only).
Load does not dry in drying cycle.	<p>Inadequate drying time.</p> <p>Sterilizer door not opened soon enough after completion of sterilize cycle.</p> <p>Load excessively wet:</p> <ul style="list-style-type: none"> • Load size too large • Load touching chamber walls • Wrapped load in bottom of tray rack (10" chamber only). <p>Door open too far or not far enough.</p>	<p>Increase drying time.</p> <p>Open the door immediately after completion of a cycle.</p> <p>Refer to "Load Chart" and "Loading" procedures.</p> <p>Door should be open approximately 1/4" if using open door drying method. (Push latch down while door is open.)</p>

Printer

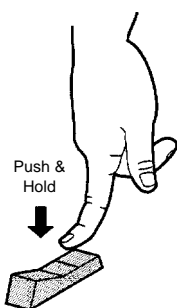


Figure 15
On/OFF Paper Feed Switch

```
STEAM STERILIZER
SOFTWARE VERSION X.XX
Serial # 1203000000000
CYCLE NUMBER 00011
SEP 6 1996 2:59 PM
UNWRAPPED INSTRUMENTS
EXPOSURE TIME = 3 MIN
EXPOSURE TEMP = 135°C
DRY TIME      = 2 MIN
```

CYCLE START

TIME MIN	PRES PSI	TEMP °C
000	0.0	44
001	0.0	46
002	0.1	52
003	0.1	65
004	0.0	86
005	0.2	97
006	0.1	100
007	0.0	100
008	0.0	100
009	0.0	100
010	2.2	104
011	8.4	113
012	15.9	121
013	25.0	130
014	31.2	135
EXPOSURE		
015	31.6	135
016	31.6	135
017	31.8	135
VENT		
018	1.2	104
DRY CYCLE START		
DRYING COMPLETE		

Figure 16
Sample Printout

Installation

MC8

Connect printer cable to receptacle on back of sterilizer.
Plug power cable/transformer into wall outlet.

MC10

The printer is factory installed. If a printer is added later, it should be installed by an authorized service technician.

Operation

The printer provides hard copy documentation of each cycle. An ON-OFF/PAPER FEED switch is provided on the printer. A pilot light indicates when the printer is activated.

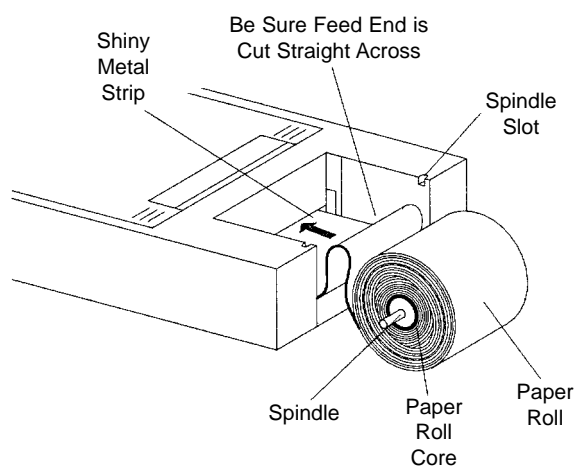


Figure 17
Paper Roll Replacement

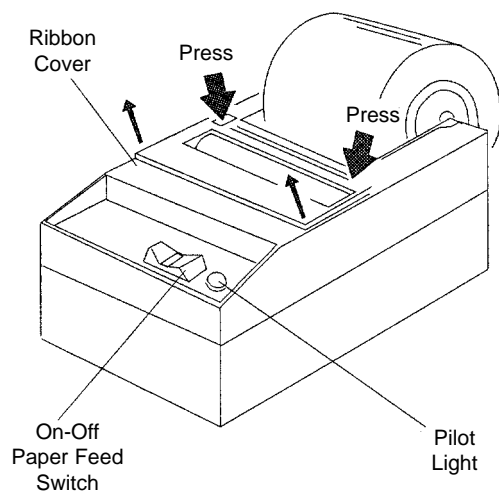


Figure 18
Ribbon Cover Removal

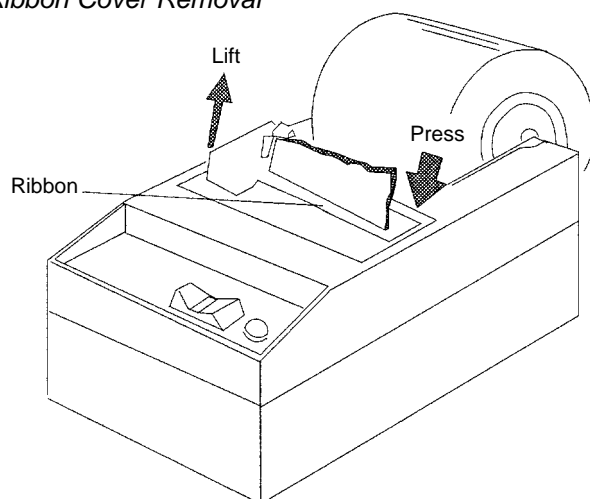


Figure 19
Ribbon Removal



Note

Cut feed end of new paper roll straight across for ease of replacement.

Paper Roll Replacement

1. To remove the old paper roll core, lift up and snap out.
2. Insert spindle into the new paper roll.
3. Feed the paper from the bottom of the roll into the paper pick up slot (between the shiny metal strips).
4. Press the paper feed switch until the paper feeds out the exit slot in the top of the printer.
5. Place the spindle in the slots and press down to snap in place.

Ribbon Replacement

1. To remove the ribbon cover, press down as shown. Lift the cover up and out.
2. To remove the ribbon, press down as shown. Grasp the ribbon and lift it from the printer.
3. Press the new ribbon down until it snaps into place.
4. Install paper roll.
5. Snap cover back in place.

Printer Removal (MC10)

1. Lift the printer out of the recess.
2. Rest the printer on the top cover while cleaning the recess. It is not necessary to disconnect the printer cables.
3. When installing the printer, tuck the excess cable into the recess.

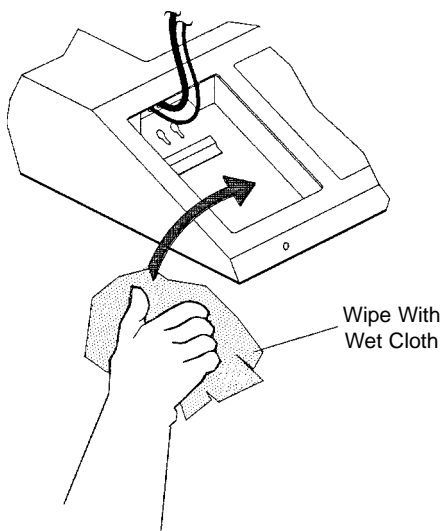
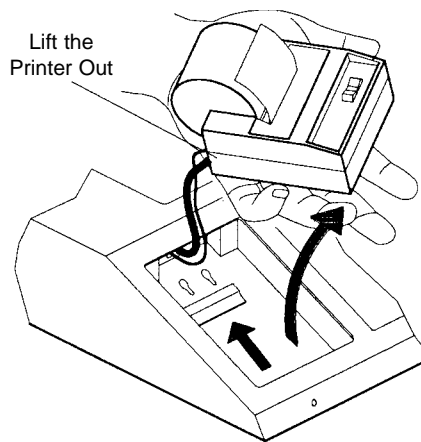


Figure 20
Printer Removal

Operator Maintenance



Hot Surface

Burn Hazard: Be sure sterilizer is cool before cleaning door gasket and mating surface.



Hot Surface

Burn Hazard: Be sure sterilizer is cool before cleaning chamber surfaces and components.



Caution

Failure to keep the interior of the stainless steel chamber free from mineral deposits or other debris can cause serious deterioration and premature failure of the chamber.



Caution

Never use a wire brush, steel wool, abrasive cleaners or cleaning agents containing chloride. These materials will damage the metal surfaces.

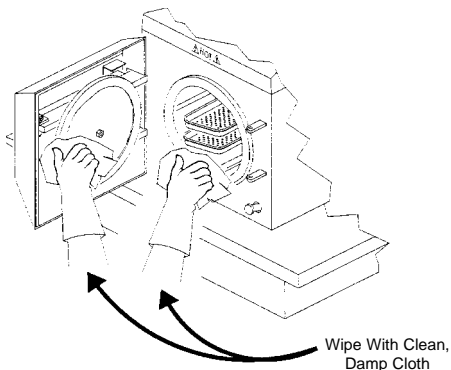


Figure 21
Door Gasket

Daily

Cleaning Door Gasket

Wipe the door gasket and mating surfaces daily with a clean damp cloth. Do not use abrasive cleaners on the gasket or mating surface.

Periodically inspect the gasket for cracks or damage. If replacement is necessary, refer to Door Gasket Replacement.

Weekly

Cleaning Chamber, Trays and Rack

At least once a week, remove the trays and rack from the chamber, and thoroughly clean the inside of the chamber (especially the bottom).

Clean the chamber, trays and rack with Harvey brand chamber cleaner. Harvey Chamber Cleaner works best in a dry chamber at room temperature.

Wipe all residue from the surfaces with a dampened, lint-free cloth.

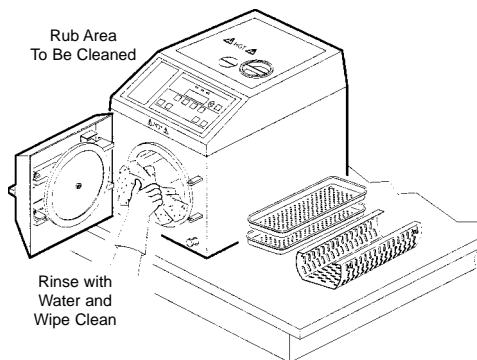


Figure 22
Cleaning Chamber



Caution

Do not use steam to disinfect or clean the sterilizer cabinet. Extreme high temperatures could cause plastic parts to become distorted.



Caution

Do not use abrasive cleansers.



Hot Surface

Burn Hazard: Be sure sterilizer is cool before cleaning reservoir. The water in the reservoir could be HOT if sterilizer was in use just prior to cleaning reservoir.



Note

Sterilizers equipped with an optional non-recirculating system may require less frequent reservoir cleaning.



Hot Surface

Burn Hazard: The water may be HOT if a cycle has been run recently. Burns could occur if hot water comes in contact with skin.

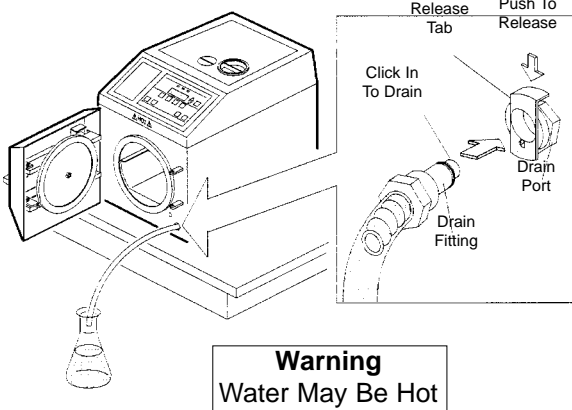


Figure 23
Draining Reservoir

Cleaning and Disinfecting

Exterior Surfaces

The exterior surfaces may be cleaned and disinfected with agents typically found in dental and medical offices. Wipe the surface clean with mild detergent and disinfect in accordance with the instructions on the disinfectant agent container.

Every 25 Cycles

Cleaning Reservoir

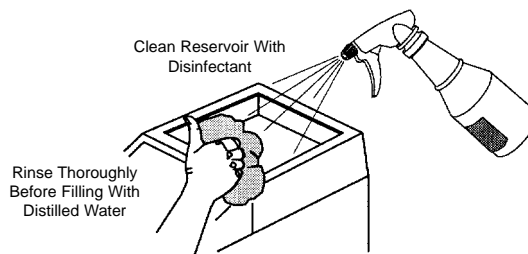


Figure 24
Cleaning Reservoir

Draining Reservoir

A drain fitting and plastic tubing are provided to drain the reservoir.

1. Insert the open end of the plastic tubing into a container.
2. Insert the drain fitting on the other end of the plastic tubing into the drain port. As soon as the drain fitting locks into place, water will begin to exit the drain.
3. When the water flow stops, press the tab on the drain port to release the drain hose and fitting.
4. Store the drain tube and fitting.



Note

Reservoir cleaning is not required as often on units with non-recirculating feature.

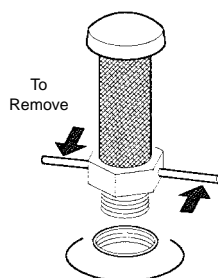


Figure 25
Reservoir Filter Screen



Hot Surface

Burn Hazard: Be sure sterilizer is cool before removing chamber filter screen.



Caution

Operating the sterilizer without the filter screen in place will damage the unit.

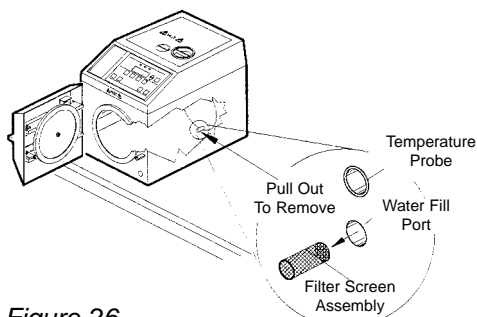


Figure 26
Filter Screen

5. Remove the reservoir lid and wipe the inside of reservoir with a clean damp cloth and mild disinfectant. Do not use abrasive cleaners. Wipe the reservoir clean of any disinfectant residue.
6. Remove and clean the reservoir filter.
7. Replace the reservoir lid and refill the reservoir to the FILL mark in the fill funnel with distilled or deionized water.

Cleaning Reservoir Filter

1. Unscrew the reservoir filter from its fitting and rinse thoroughly with clean water.
2. Scrub the outside of the filter with a stiff-bristled brush (toothbrush) or clean in an ultrasonic cleaner.

If the above cleaning method does not effectively clean the filter, replace it.

Cleaning Chamber Filter Screen

1. Pull the filter screen assembly out of the water fill port inside the chamber.
2. Clean any deposits from the screen using a small stiff-bristled brush (toothbrush) or ultrasonic cleaner.
3. When clean, push the open end of the filter screen into the water fill port in the back of the chamber.

**Note**

The fill port is the bottom hole in the back of the chamber. The top hole is for the temperature probe and should not be obstructed.

**Hot Surface**

Burn Hazard: Do not empty the collection bottle when the sterilizer is in operation.

**Note**

It is important to periodically check the water in the collection bottle. Failure to empty the bottle when full will result in water overflowing onto surrounding surfaces.

When Required

Emptying Non-Recirculating

Collection Bottle

Empty the collection bottle when the water in the bottle reaches the FULL mark.

Slide the bottle away from the cooling tank to remove.

Pour the contents down the drain.

Cleaning Printer Recess (MC10)

The MC10 printer may be removed to allow cleaning of the recessed area. See the "Printer" section for removal procedure. Use a mild disinfectant to clean the recess.

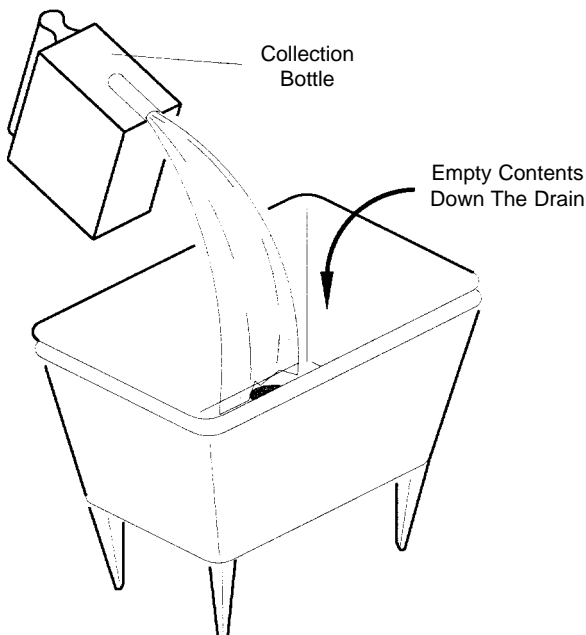


Figure 27
Emptying Non-Recirculating Collection Bottle



Note

The gasket is adhered to the door plate and must be pulled loose.



Note

Allow about an hour for the silicone sealant to set, then run a no-load cycle to seat gasket.

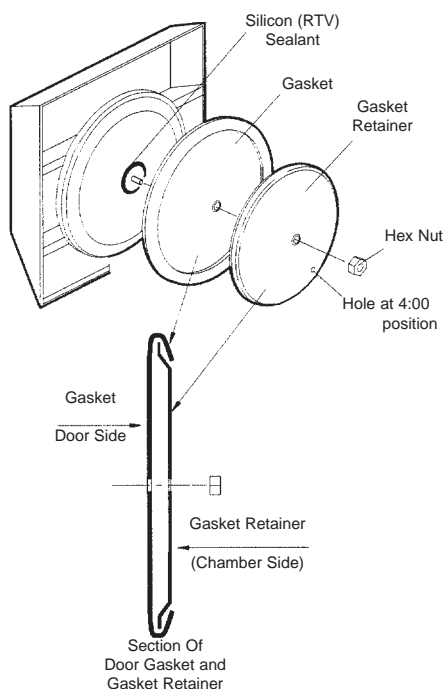


Figure 28
Door Gasket Replacement

Replacing Door Gasket

1. Open the sterilizer door and remove the hex nut in the center of the gasket retainer and remove the gasket retainer and gasket.
2. Clean surface of the door plate, new gasket and gasket retainer of any dirt, adhesives or deposits.
3. Apply a generous amount of silicone multipurpose sealant (available in most hardware stores) in a 2" diameter area around the center stud of the door plate.
4. Insert the retainer inside the gasket (outer lip of retainer against gasket) as shown.
5. Slide the gasket and retainer assembly onto the center stud of the door plate and secure it finger tight (firm). **Do not use wrench.**



Warning

Burn Hazard: Steam blow-off will be discharged when the ring on the relief valve is pulled. To prevent possible burns from steam discharge, keep away from the valve. **Use pliers to pull the valve ring—do not pull ring with fingers. Wear protective gloves.**

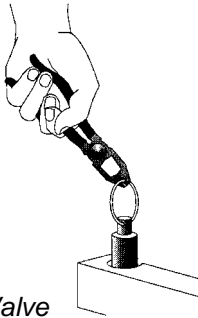


Figure 29
Pressure Relief Valve



Note

If traces of steam continue to escape through the valve, the valve has not re-seated properly. Open and close the valve quickly (several times if necessary) by pulling the ring and letting it snap closed.

Every 6 Months

The pressure relief (safety) valve, located on the back of the cabinet, releases excess pressure (over 45 psi) from the chamber.

To check the valve for proper operation:

1. Run an UNWRAPPED INSTRUMENTS cycle with no load in the chamber.
2. When the pressure reaches 30 psi (206 kPa), pull the ring on the pressure relief valve for about 3 seconds. **Do not hold the valve open.** Steam should freely discharge from the valve outlet.
3. If valve malfunctions, the valve must be replaced. Call for authorized service.
4. Cancel cycle after checking valve to prevent overheating.



Hot Surface

Burn Hazard: Do not clean the tank when the sterilizer is in operation. Allow the Non-recirculating Cooling Tank to cool to room temperature **before** cleaning the tank.

Cleaning Non-Recirculating Water

Cooling Tank

The non-recirculating water cooling tank should be drained and rinsed out every six months. Do not clean the tank when the sterilizer is in operation.

Using the optional overflow tube (supplied) push the connector fitting into the drain connection at the bottom of the tank to empty it.

Remove the drain tube when the tank is empty, and rinse the tank with a solution of household bleach (3/4 cup) and distilled or deionized water (1 gal.). Drain solution and rinse with distilled or deionized water before refilling.

Clean filter in the inlet line fitting before connecting to sterilizer.

Refill the tank with clean distilled or low quality deionized water (minimum 0.5 megohm/cm, maximum 1.5 megohm/cm) to put the system back in service.

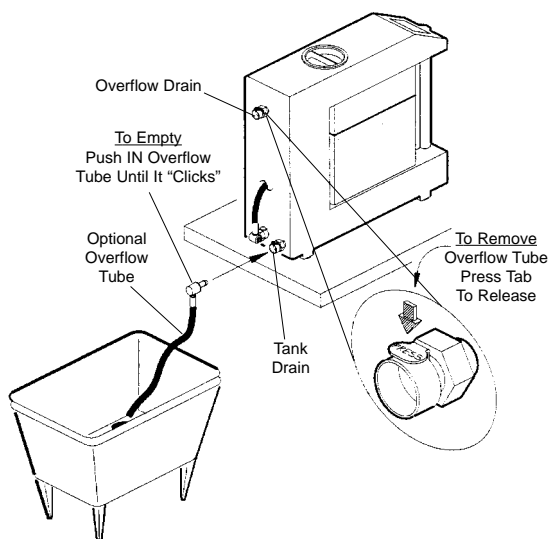


Figure 30
Cleaning the Cooling Tank

Recommended Spare Parts



Warning

Electrical shock Hazard: Do not remove access covers. This equipment should only be serviced by qualified personnel.



Note

Refer to **Service Manual LT1203X2** for piping schematic, and servicing procedures. Refer to **Parts Catalog LT1203X3** for illustrated parts list.

The following parts should be kept on hand for prompt replacement when needed.

Qty.	Part No.	Description
2	266058	Fuse, 115 Volt + Model - 15 Amp, 250 volt, 5 x 20 mm Type TD
2	264306	Fuse, 230 volt Model - 8 Amp, 250 volt, 5 x20 mm Type D
2	265076	Screen, Reservoir Filter
1	265081	Screen, Chamber Drain
1	2-69904	Door Gasket, MC8
1	2-513005	Door Gasket, MC10
1	260284	Paper Roll (box of 6 rolls)
1	264116	Printer Ribbon
1	232010101	Harvey Chamber Cleaner (6 quart bottles)
1	232010103	Cleaning Pads (36)
1	232010102	Harvey Chamber Cleaner (case of 6 pint bottles)
1	267467	Screen in Non-Recirculation Tank

Installation



Warning

Explosion Hazard: Do not locate this sterilizer in areas where explosive anesthetics are used or stored. An explosion could occur, causing possible equipment damage and injury for personnel.



Note

The MC8 weighs 55 lbs. (25 kg); the MC10 weighs 70 lbs. (32 kg). The sterilizer should be lifted by two persons and transported on a cart.

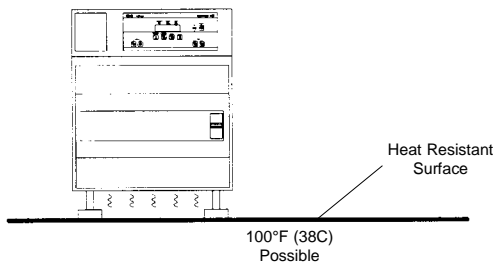


Note

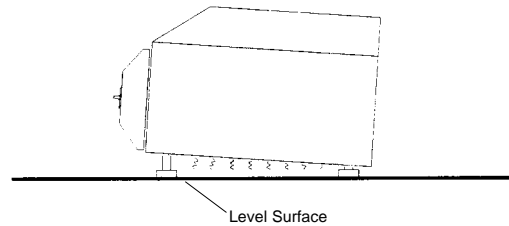
Do not operate this sterilizer within 6 ft. of patient treatment point.

PLACE STERILIZER ON A LEVEL SURFACE

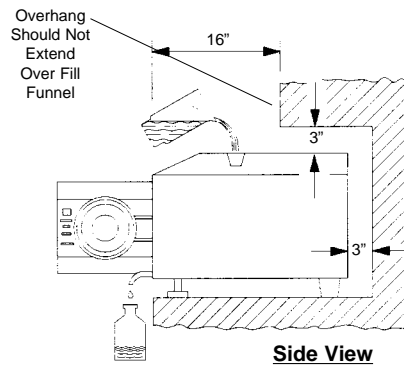
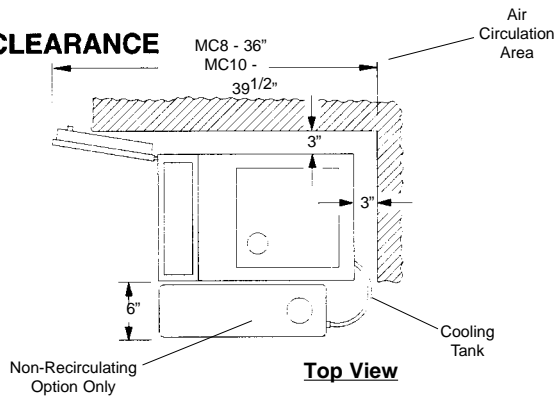
Side To Side



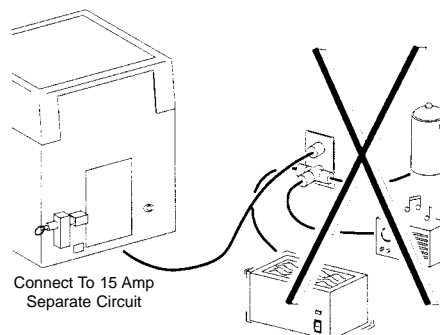
Front To Back



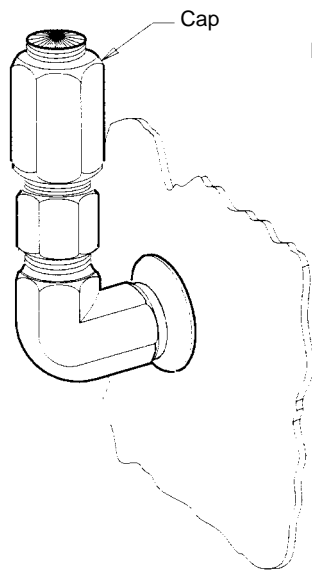
CLEARANCE



ELECTRICAL CONNECTION

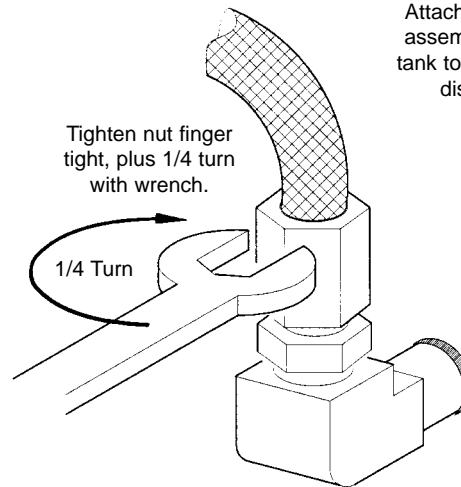


Non-Recirculating Water Accessory Installation



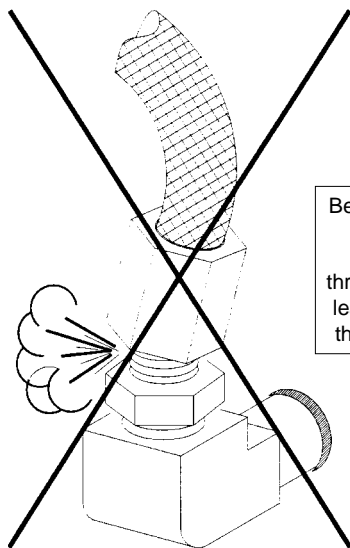
Step 1

Remove cap from non-recirculating discharge port on rear of sterilizer and discard.



Step 2

Attach discharge hose assembly from cooling tank to non-recirculating discharge port.



Be sure connection nut is started straight. Cross threading will cause leaks and damage the nut and fitting.

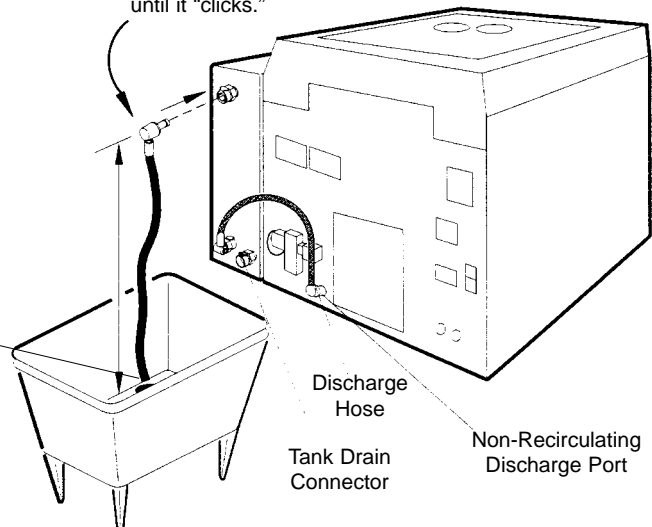
Step 3

Automatic

Optional Overflow

Push the overflow tube into the overflow connector at the top of the cooling tank until it "clicks."

Do Not push this end into drain trap



Setting the Clock/Calendar

1. Plug in the power cord, but do not press controls ON.

The software will perform a self-test, then the time and date will be displayed.

2. Press PROGRAM/SET switch.

- a. The hour will flash:

<p>12:00 AM JAN 01 1998</p>
--

Use the UP arrow to set the hour ahead or the down arrow to set it back. When the clock is set to the correct hour, press PROGRAM/SET to store the hour in memory.

- b. The minute will flash:

<p>12:00 AM JAN 01 1998</p>
--

Use the arrows to set the minute. Press PROGRAM/SET to store.

- c. The AM/PM indicator will flash:

<p>12:00 AM JAN 01 1998</p>
--

Press either arrow to alternate between AM and PM. Press PROGRAM/SET to store.

- d. The month will flash:

<p>12:00 AM JAN 01 1998</p>
--

INSTALLATION

Use the arrows to set the month. Press PROGRAM/SET to store.

e. The day will flash:

12:00 AM JAN 01 1998

Use the arrows to set the day. Press PROGRAM/SET to store.

f. The year will flash:

12:00 AM JAN 01 1998

Use the arrows to set the year. Press PROGRAM/SET to store.

3. The clock/calendar is now ready.



Warning

Non-Recirculating Option must be installed before proceeding.

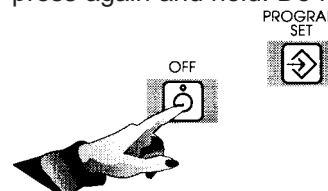


Note

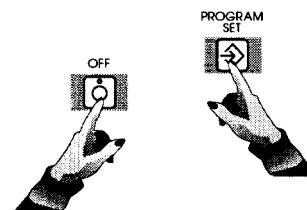
This operation requires the use of two hands. You must tell the sterilizer that the non-recirculating feature is ready. This only takes a few seconds. If at any time you wish to discontinue this activation mode, press cycle stop.

1. Activate the non-recirculating feature:

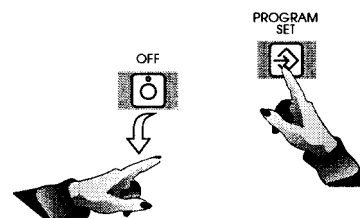
- a. Press and release OFF switch, then press again and hold. Do not release.



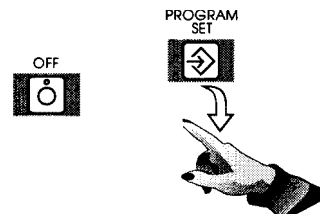
- b. Press and hold PROGRAM/SET switch. Do not release.



- c. Release the OFF switch ONLY.



- d. Release the PROGRAM/SET switch.



The sterilizer is now ready for you to proceed with Step 2.



Caution

The following messages will appear. Failure to follow these instructions may result in improper operating conditions.

2. Press PROGRAM/SET after each of the following messages.

LOG ERXX XXXXX
DATE TIME

Press PROGRAM/SET

DIAGNOSTICS
NO

Press PROGRAM/SET

12 HOUR CLOCK

Press PROGRAM/SET

TEMPERATURE
CELSIUS

Press PROGRAM/SET

PRESSURE UNITS
PSI

Press PROGRAM/SET

LANGUAGE
ENGLISH

Press PROGRAM/SET

CONFIGURATION
HARVEY

Press PROGRAM/SET

Press PROGRAM/SET

**MODEL MC8 OR
MC10**

Press PROGRAM/SET

STANDARD UNIT

Press PROGRAM/SET

3. When RECIRCULATE is displayed, press either the up or down arrow to change to NON-RECIRCULATE.



RECIRCULATE

Press PROGRAM SET

STERILIZE

Press STOP (This will revert back to the main display menu, time and date.)

Technical Data

	MC8	MC10
Cabinet Size	13-1/2" W x 16" H x 23" L (33 mm W x 406mm H x 559mm L)	16" W x 18" H x 23" L (406mm W x 457mm H x 584mm L)
Chamber Size	8" diameter x 14-1/2" usable depth (203mm diameter x 368mm)	10" diameter x 15-1/2" usable depth (254mm diameter x 393mm)
Tray Sizes	Two 14" x 6-1/4" x 7/8" (356mm x 135mm x 22mm)	One 15-1/4" x 9" x 1-1/4" (387mm x 228mm x 32mm)
Weight	55 lbs (25 kg)	70 lbs (32 kg)
Wattage	1440 Watts	1440 Watts
Electrical Rating	115 VAC, 50/60 Hz, 12 Amps or 230 VAC, 50/60 Hz, 6 Amps (See Note)	115 VAC, 50/60 Hz, 12 Amps or 230 VAC, 50/60 Hz, 6 Amps (See Note)
Reservoir Capacity	3000 mL (approx. 3 quarts)	4000 mL (approx. 4 quarts)
Maximum Rated Operating Pressure	45 psi (310kPa)	45 psi (310 kPa)
Environmental Conditions		
Operation	10° to 40°C (50° to 104°F) 30% to 70% relative humidity, non-condensing	10° to 40°C (50° to 104°F) 30% to 70% relative humidity, non-condensing
Altitude Limit	2,000 meters	2,000 meters
Storage and Transport	-20° to 60°C (-4° to 140°F) 10% to 100% relative humidity	-20° to 60°C (-4° to 140°F) 10% to 100% relative humidity
Printer (Optional)		
Electrical Rating	9 VAC; 1 Watt (idle), 10 Watts (running)	9 VAC; 1 Watt (idle), 10 Watts (running)
Non-Recirculating Water Accessory (Optional)		
Size	6-3/4" W x 13-1/2" H 15-1/4" L (171mm W x 343mm H x 387mm L)	6-3/4" W x 13-1/2" H 15-1/4" L (171mm W x 343mm H x 387mm L)
Capacity	11.36 L (approx. 3 gallons)	11.36 L (approx. 3 gallons)
Reservoir Water	Distilled or Low quality Deionized water (minimum 0.5 megohm/cm, maximum 1.5 megohm/cm).	Distilled or Low Quality Deionized water (minimum 0.5 megohm/cm, maximum 1.5 megohm/cm).

NOTE: Dual-voltage government models meet the requirements of IEC 601-1, Class I, Type B equipment.

Appendix



Warning

Unplug power cord before removing any access panels. Voltage conversion should be performed by a qualified service technician.



Note

Dual voltage models have both voltages listed on the rating plate. Do not attempt to convert a unit that does not have two fuseholders or is not listed as a 115V/230V model.

Voltage Conversion (Dual Voltage Models Only)

(Spec plate must state 115/230 Volt)

1. Remove the left side panel (4 screws), the pressure relief valve deflection cover (MC8 Only — 1 screw), and the rear access panel (2 screws).
2. Remove fuses from fuseholders. Discard or save for future reconversion.

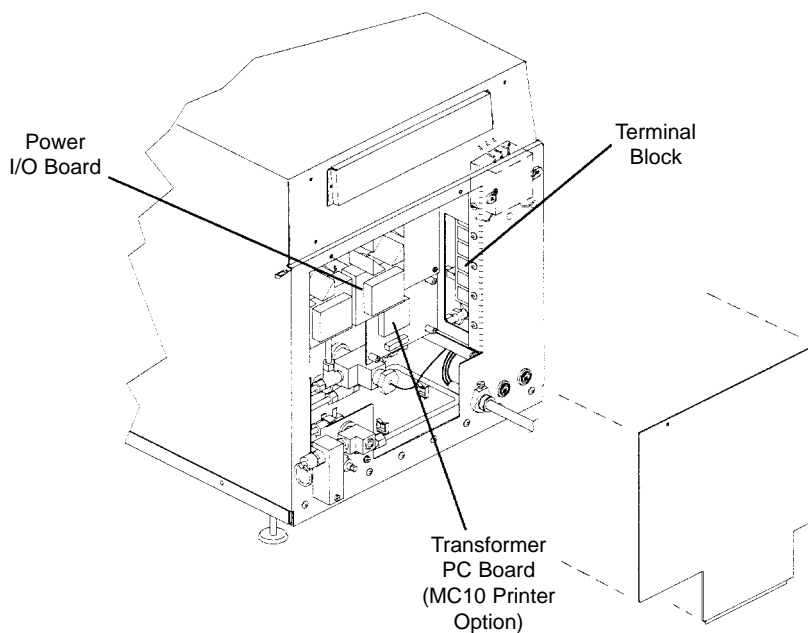


Figure 31
Removing access panels

115 VAC to 230 VAC

Parts Required

- Two 8 Amp time delay fuses (Part No. 264306)
 - Suitable 230 VAC plug or plug adapter
1. On the Power I/O PC Board: Remove jumpers from J5 to J7 and J3 to J8. Install jumper from J7 to J8. (Save other jumper for future reconversion to 115 VAC.)
 2. Move white heater wire from J11 to J12. Move black heater wire from J14 to J11. Leave other black wire connected.
 3. On the Printer Power PC Board (MC10 with Printer Only): Remove jumpers from JMP1 and JMP2 positions and install jumper in JMP3 position. (Save other jumper for future reconversion to 115 VAC.)
 4. Install the 8 Amp fuses in fuseholders.
 5. Reinstall the left side panel, rear access panel, and pressure relief valve deflection cover.
 6. Use either a plug adapter or remove the power cord plug and install a suitable 230 VAC plug.
 7. Tag the sterilizer as configured for 230 VAC.

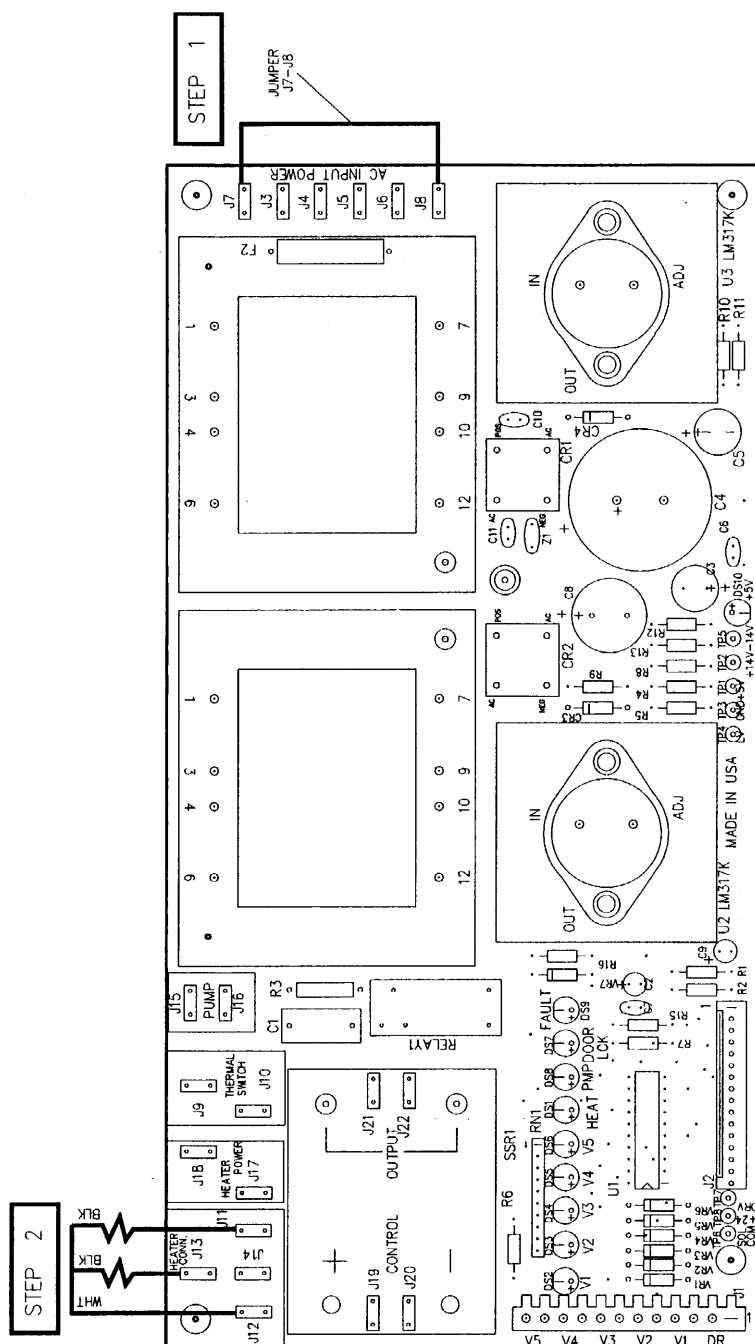


Figure 32
Power I/O PC Board (230 VAC)

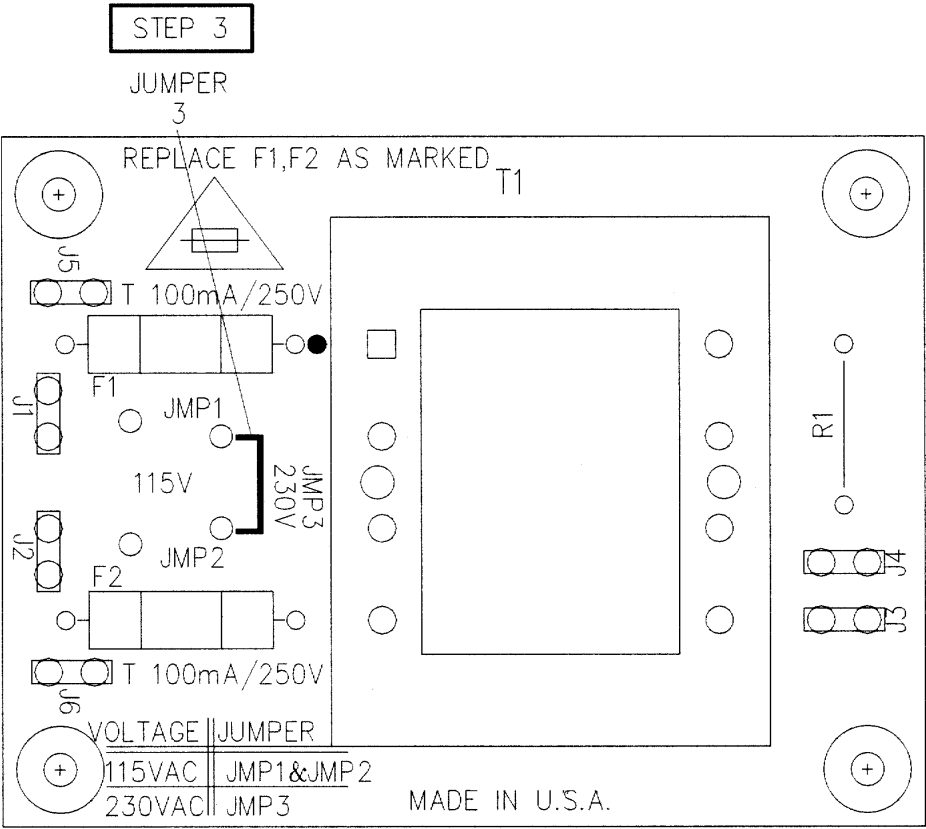


Figure 33
MC10 Printer Power Supply Board (230 VAC)

230 VAC to 115 VAC

Parts Required

- two 15 AMP time delay fuses (Part No. 266058)
 - jumper for Power I/O Board
 - jumper for Printer Power PC Board
 - suitable 115 VAC plug or plug adapter
1. On the Power I/O PC Board: Remove jumper from J7 to J8. Install jumpers from J5 to J7 and from J3 to J8.
 2. Move black heater wire from J11 to J14. Move white heater wire from J12 to J11. Leave the other black wire connected.
 3. On the Printer Power PC Board (MC10 with printer only): Remove jumper from JMP3 position and install jumpers in JMP1 and JMP2 positions.
 4. Install the 15 AMP fuses in fuseholders.
 5. Reinstall the left side panel, rear access panel and pressure relief valve deflection cover.
 6. Use either a plug adapter or remove the power cord plug and install a suitable 115 VAC plug.
 7. Tag the sterilizer as configured for 115 VAC.



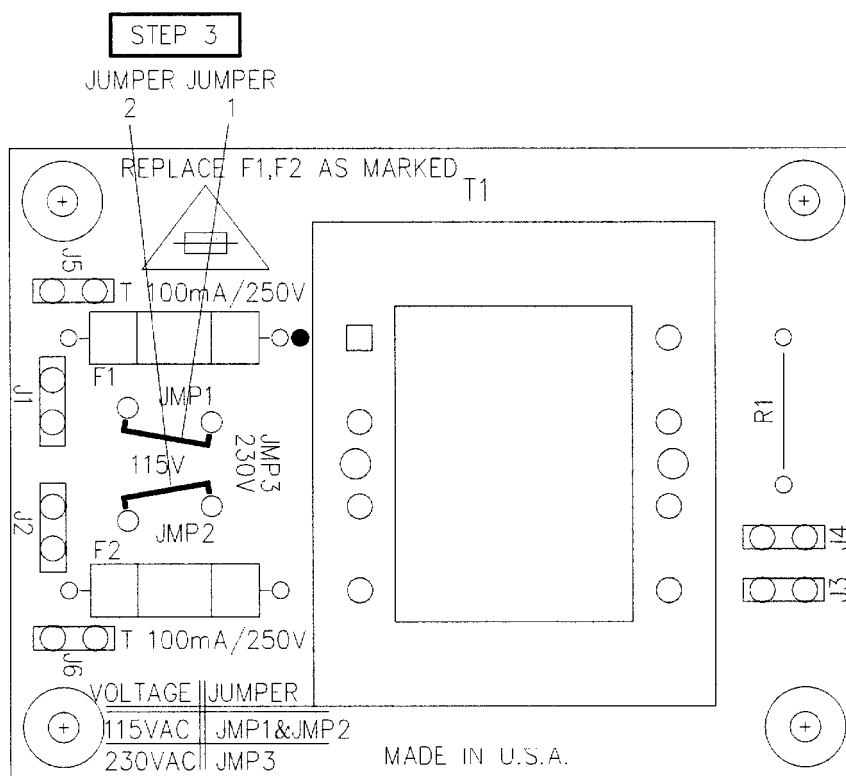


Figure 35
MC10 Printer Power Supply Board (115 VAC)

Two Year Limited Warranty

Barnstead International ("BARNSTEAD") warrants that if a product manufactured by Barnstead shall be free of defects in materials and workmanship for two (2) year from the first to occur of (i) the date the product is sold by BARNSTEAD or (ii) the date the product is purchased by the original retail customer (the "Commencement Date"). Except as expressly stated above, BARNSTEAD MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO THE PRODUCTS AND EXPRESSLY DISCLAIMS ANY AND ALL WARRANTIES, INCLUDING BUT NOT LIMITED TO, WARRANTIES OF DESIGN, MERCHANT ABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

An authorized representative of BARNSTEAD must perform all warranty inspections. In the event of a defect covered by BARNSTEAD's warranty, BARNSTEAD shall, as its sole obligation and exclusive remedy, provide free replacement parts to remedy the defective product. In addition, for products sold by BARNSTEAD within the continental United States or Canada, BARNSTEAD shall provide provide free labor to repair the products with the replacement parts, but only for a period of ninety (90) days from the Commencement Date.

BARNSTEAD's warranty provided hereunder shall be null and void and without further force or effect if there is any (i) repair made to the product by a party other than BARNSTEAD or its duly authorized service representative, (ii) misuse (including use inconsistent with written operating instructions for the product), mishandling, contamination, overheating, modification or alteration of the product by any customer or third party or (iii) use of replacement parts that are obtained from a party who is not an authorized dealer of BARNSTEAD.

Heating elements, because of their susceptibility to overheating and contamination, must be returned to the BARNSTEAD factory and if, upon inspection, it is concluded that failure is due to factors other than excessive high temperature or contamination, BARNSTEAD will provide warranty replacement. As a condition to the return of any product, or any constituent part thereof, to BARNSTEAD's factory, it shall be sent prepaid and a prior written authorization from BARNSTEAD assigning a Return Materials Number to the product or part shall be obtained.

IN NO EVENT SHALL BARNSTEAD BE LIABLE TO ANY PARTY FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR FOR ANY DAMAGES RESULTING FROM LOSS OF USE OR PROFITS, ANTICIPATED OR OTHERWISE, ARISING OUT OF OR IN CONNECTION WITH THE SALE, USE OR PERFORMANCE OF ANY PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, TORT (INCLUDING NEGLIGENCE), ANY THEORY OF STRICT LIABILITY OR REGULATORY ACTION.

The name of the authorized Barnstead International dealer nearest you may be obtained by calling 1-800-446-6060 (319-556-2241) or writing to:

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